

CLAIMS

1. A back illuminated photodetector comprising:

a first conductive type semiconductor substrate;

5 a second conductive type impurity semiconductor region provided in the first superficial surface layer of said semiconductor substrate;

a recessed portion for incidence of to-be-detected light formed in the second surface of said semiconductor substrate and in an area opposite said impurity semiconductor region;

10 a coating layer made of resin for transmitting said to-be-detected light to said recessed portion and having a substantially flat surface, said coating layer being provided on the second surface; and

a window plate provided on said surface of said coating layer to transmit said to-be-detected light to said coating layer.

15 2. The back illuminated photodetector according to claim 1,

wherein

20 said coating layer consists of a first resin layer provided on the second surface and a second resin layer provided on said first resin layer and having a substantially flat surface on the opposite side of said first resin layer, and wherein

said first resin layer is arranged in such a manner that the portion provided on said recessed portion in the second surface is sunk lower than the portion provided on the outer edge portion of said recessed portion.

25 3. The back illuminated photodetector according to claim 1 or 2,

further comprising a supporting film provided on the first surface of

said semiconductor substrate to support said semiconductor substrate.

4. The back illuminated photodetector according to Claim 3, further comprising a filling electrode penetrating through the supporting film and connected electrically to the impurity semiconductor region at 5 one end thereof.

5. The back illuminated photodetector according to any of claims 1 to 4, wherein said window plate has a square cross-sectional shape with at least one corner being chamfered in a plane perpendicular to the thickness direction thereof.

10 6. The back illuminated photodetector according to any of claims 1 to 5, wherein a highly-doped impurity semiconductor region with impurities of said first conductive type added thereto at a high concentration is exposed across the entire side surface of said semiconductor substrate.

15 7. The back illuminated photodetector according to any one of Claims 1 to 6, wherein a highly-doped impurity semiconductor layer with impurities of the first conductive type added thereto at a high concentration is provided in the bottom portion of the recessed portion within the second superficial surface layer of the semiconductor 20 substrate.

25 8. The back illuminated photodetector according to any of claims 1 to 7, wherein a highly-doped impurity semiconductor layer with impurities of said first conductive type added thereto at a high concentration is provided in the second superficial surface layer in the outer edge portion of said semiconductor substrate.